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METHODS AND APPARATUS FOR MODEL  
BASED SHROUDED BELLOWS STIFFNESS  
DETERMINATIONS

ABSTRACT OF THE DISCLOSURE

A modeling system predicts natural frequency responses in tube sub-systems including shrouded bellows components. The system determines a stiffness multiplier from input values and uses the determined flexibility factor to determine the natural frequency responses. The input values include geometry inputs and dynamic operating condition inputs. The flexibility factor is determined with a regression equation. The regression equation, based on dynamic stiffness test data of various shrouded bellows configurations, permits the system to characterize the shrouded bellows using a geometry element that includes an assigned flexibility factor based on dynamic stiffness test data.